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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/606,358	06/26/2003	Naohiko Kikuchi	1403-0250P	4535

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EXAMINER	
MAKI, STEVEN D	

ART UNIT	PAPER NUMBER
1791	

NOTIFICATION DATE	DELIVERY MODE
03/07/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary	Application No.	Applicant(s)	
	10/606,358	KIKUCHI ET AL.	
	Examiner	Art Unit	
	Steven D. Maki	1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 February 2008 and 22 October 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,9,12 and 13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,9,12,13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

1) A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10-22-07 has been entered.

2) The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3) Claim 13 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 13 recites "which exhibits an enhanced balance in braking properties on ice and abrasion resistance". One of ordinary skill in the art is not appraised of the scope of protection afforded by this language. It is unclear if this language narrows the scope of the specified range for E1/E2 and/or tread rubber hardness. It is unclear if this language adds additional limitation(s) such as a specific size for the fibers or a specific composition for the sulfur containing mercapto silane.

4) Applicant is advised that should claim 1 be found allowable, claim 13 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing

one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

The description of "which exhibits an enhanced balance in braking properties on ice and abrasion resistance" in claim 13 does not appear to cause a difference in scope between claims 1 and 13.

5) The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6) **Claims 1, 9, 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uchida (EP 1,072,446) in view of Marzocchi 059 (US 3,364,059) and Marzocchi 280 (US 3,620,280).**

Uchida, directed to a tire which improves or balances adhesion, adhesion friction, digging friction, scratching friction and abrasion resistance, and has excellent performance on ice and snow covered roads, discloses a studless tire having a tread comprising diene rubber and short glass fibers dispersed in the diene rubber so as to be oriented in the tread thickness direction, wherein when measured at 25°C, the tread has a ratio of complex elastic modulus E1 in the tread thickness direction and complex elastic modulus E2 in the tire circumferential direction of $1.1 \leq E1/E2 \leq 4$ and a tread rubber hardness measured at -10°C of 45 to 75 degrees. The glass fibers have an average fiber diameter of 1-100 micrometers (preferable 3-50 micrometers) and an average length of 0.1-5 mm (preferably 0.1-3 mm). See abstract and paragraphs 6-21

and example 1. In paragraph 13, Uchida teaches that the thickness oriented short fibers form portions having locally high ground contact pressure for pushing away water film generated between the frozen road and the tire surface. Uchida also teaches that adhesion and adhesion friction are improved, and digging and scratching friction are also improved at the same time. In paragraph 16, Uchida teaches that the desired effect of pushing away the water film is deteriorated if the fibers drop from the tread surface during running. Therefore, Uchida expresses a desire for the fibers to remain bound to the rubber of the tread to prevent the fibers from dropping from the tread surface during running and thereby prevent deterioration of the effect of pushing the water film generated between the frozen road surface and the tire surface (paragraphs 13, 16). In invention example 1, the braking performance on ice is 125. Uchida substantially discloses the claimed invention except for surface treating the short glass fibers.

Marzocchi 059, directed to glass fiber elastomeric systems, teaches that the development of a strong and permanent bonding relationship between glass fibers and elastomeric materials is faced with a number of problems which are peculiar to glass fibers. Glass fibers are non-porous and have smooth surfaces. Elastomeric materials are unable to achieve anchorage and are unable to establish a strong grip on the smooth surfaces. Furthermore, the smooth surfaces are dominated by groups which impart hydrophilic characteristics whereby the glass fiber surfaces are preferentially receptive to moisture by comparison with elastomeric materials. As a result, any bonding relationship that is capable of being established between such materials is

markedly diminished by the water film that immediately forms to separate the elastomeric material from the glass fiber surfaces in the presence of moisture. Marzocchi 059 teaches improving the bonding relationship of glass fibers with rubber by treating the glass fibers with a mercaptan-containing organo silane anchoring agent ("sulfur containing mercaptosilane"). Marzocchi 059's anchoring agent, which comprises "-SH" (the mercapto group), is represented by the formula $R_nSiX_{(4-n)}$. Marzocchi 059 teaches that a strong bonding relationship between the glass fibers and the elastomeric material is retained even in the presence of moisture. Marzocchi 059 teaches that the glass fibers are better able to contribute their properties to products fabricated thereof when a strong and permanent bonding relationship is developed between the glass fibers and the elastomeric material. See columns 1 and 2. Marzocchi 059 teaches that the glass fibers may be continuous glass fibers, staple glass fibers or chopped glass fibers (col. 2 lines 34-44). Marzocchi 059 teaches that the elastomer includes natural rubber (a diene rubber) and synthetic rubber. See col. 2 lines 45-49.

Marzocchi 280, directed to the tire art, discloses treating glass filaments with an anchoring agent such as mercapto substituted organoalkoxy silane ("sulfur containing mercapto silane") and then manufacturing a composite cord by wrapping the treated glass filaments around an organic core. Marzocchi 280 teaches a pneumatic tire having a tread comprising rubber and short composite cords 83. The short composite cord has a length such as 1/8 inch (3.1 mm). The short composite cords were obtained by

chopping the composite cord to short lengths. See figure 5, columns 4 and 5 and especially col. 5 lines 57-68.

As to claim 1, it would have been obvious to one of ordinary skill in the art to treat the short glass fibers of Uchida with an anchoring agent (surface treating agent) comprising sulfur containing mercaptosilane to improve adhesion of the short glass fibers to the rubber of the tire tread since (1) Uchida expresses a desire for the glass fibers to remain bound to the rubber of the tread to prevent the glass fibers from dropping from the tread surface so as to prevent deterioration of the effect of pushing the water film generated between the frozen road surface and the tire surface (paragraphs 13, 16) and (2) the secondary art to Marzocchi 059 and Marzocchi 280 provide ample motivation (strong bond between glass fibers and rubber even in the presence of moisture) to treat Uchida's glass fibers for a rubber tire tread with an anchoring agent comprising sulfur containing mercapto silane. Uchida incorporates glass fibers in rubber. Uchida, Marzocchi 059 and Marzocchi 280 are in the same general field of endeavor of glass fiber elastomeric systems. The claimed subject matter of orienting glass fibers in the thickness direction of the tread is disclosed by Uchida. See Uchida's figure 1(b), which is the same as appellant's figure 1(b). Marzocchi 059 appraises one of ordinary skill in the art of the well known problem of anchoring glass fibers in rubber. Marzocchi 059 informs one of ordinary skill in the art that the non-porous smooth surfaces of glass fibers prevent establishment of a strong grip between the glass fibers and elastomeric material. Marzocchi 059 teaches preventing separation of glass fibers from elastomeric material by treating glass fibers

with a mercaptan-containing organo silane anchoring agent before incorporating the glass fibers in rubber. See column 2 lines 10-15, 50-71 of Marzocchi 059. Marzocchi 059 motivates one of ordinary skill in the art to treat Uchida's glass fibers with an anchoring agent ("sulfur containing mercaptosilane") to obtain a strong bond between the glass fibers and the rubber so that that the glass fibers are better able to contribute their properties to products fabricated with glass fibers. Prevention of separation of glass fibers from rubber is desired by Uchida because Uchida teaches that the glass fibers should not drop from the tread surface during running (paragraph 16). If the fibers drop from the tread, then there are no longer bound to the rubber of the tread. Uchida teaches away from a tread in which the glass fibers separate from the tread during running. See paragraph 16 of Uchida. Marzocchi 280 and Uchida are directed to a tread for a pneumatic tire. Both Marzocchi 280 and Uchida incorporate fibers in the tire tread. Marzocchi 280 teaches forming a yarn by wrapping a glass filament about an organic core, chopping the yarn into short lengths and incorporating the short lengths in tread rubber such that the short lengths are randomly oriented. Marzocchi 280 treats the glass filament with an anchoring agent in the form of "sulfur containing mercapto silane" before incorporating the short lengths in the tread rubber. See col. 5 lines 55-58 of Marzocchi 280. Marzocchi 280 makes it apparent to one of ordinary skill in the art that glass fibers should be treated with "sulfur containing mercapto silane" when incorporated in rubber, which like that of Uchida, is used for the tread of a pneumatic tire.

As to claims 9 and 12, Uchida's glass fibers have an average fiber diameter of

1-100 micrometers (preferable 3-50 micrometers) and an average length of 0.1-5 mm (preferably 0.1-3 mm).

As to claim 13, the description of "which exhibits an enhanced balance in braking properties on ice and abrasion resistance" fails to require a ratio E1/E2 and rubber hardness different from that disclosed by Uchida. Furthermore, the description of "which exhibits an enhanced balance in braking properties on ice and abrasion resistance" fails to require a specific "sulfur containing mercaptosilane" different from that disclosed by either Marzocchi 059 or Marzocchi 280.

Remarks

7) Applicant's arguments filed 2-5-08 and 10-22-07 have been fully considered but they are not persuasive.

Background

Uchida, directed to the tire art, discloses a studless tire having a tread comprising diene rubber and short glass fibers dispersed in the diene rubber so as to be oriented in the tread thickness direction, wherein when measured at 25°C, the tread has a ratio of complex elastic modulus E1 in the tread thickness direction and complex elastic modulus E2 in the tire circumferential direction of $1.1 \leq E1/E2 \leq 4$ and a tread rubber hardness measured at -10°C of 45 to 75 degrees. In invention example 1, the braking performance on ice is 125.

Marzocchi 059, directed to glass fiber elastomeric systems, teaches that the development of a strong and permanent bonding relationship between glass fibers and rubber is faced by a number of problems such as the non-porous smooth surface of glass fibers. Marzocchi 059 teaches treating glass fibers with mercaptan-containing organo silane anchoring agent to obtain a strong bond between the glass fibers and rubber so that the glass fibers are better able to contribute their properties to products fabricated thereof.

Marzocchi 280, directed to the tire art, discloses treating glass filaments with an anchoring agent such as a mercapto substituted organoalkyoxy silane, wrapping the treated glass filaments around an organic core to form composite cord,

chopping the composite cord to form short composite cords and forming a tire having a tread comprising rubber and short composite cords.

Prosecution History

In the Examiner's Answer dated 12-28-06, claims 1, 9 and 12 were rejected under 35 U.S.C. 103(a) as being unpatentable over Uchida (EP 1,072,446) in view of Marzocchi 059 (US 3,364,059) and Marzocchi 280 (US 3,620,280). This 103 rejection was AFFIRMED on 8-22-07 by the Board of Patent Appeals and Interferences. On pages 4-5 of the Board decision dated 8-22-07, the Board held "Contrary to Appellants' arguments, it would have been obvious to combine the teachings of Uchida, Marzocchi '059 and Marzocchi '280 for the reasons stated by the Examiner. Uchida describes the advantages of incorporating short glass fibers into a studless tire. Uchida also discloses that it is desirable to prevent the fibers from dropping out of the tread surface during running (¶0013-0016). A person of ordinary skill in the art would have recognized that the advantages disclosed by Uchida would have been lost if the glass fibers were allowed to separate from the tread. A person of ordinary skill in the art seeking to prevent the glass fibers from separating from the tire tread would look to a surface treating agent such as described by Marzocchi '059 and Marzocchi '280 to solve this problem."

Response to Argument

Applicant argues that the claimed invention exhibits unexpected results of improved braking properties and abrasion resistance properties. The 132 declaration by Kikuchi filed 2-5-08 and the examples in the specification have been considered but are not persuasive of obviousness.

First: The results in the 132 declaration filed 2-5-08 and the results in the specification are not commensurate in scope with the claims. The results for Experiment 1 ("invention example") and Experiment 3 ("Uchida example") in the 132 declaration filed 2-5-08 are for *a tire in which the tread was made using the "Method of Fig.2"*. The results for Example 1 ("invention example") and Comparative Example 2 in the specification are for a tire in which the tread was made using the "Method of Fig.2". Claims 1, 9, 12 and 13 do not require the tread of the tire to have been made using the "Method of Fig. 2" and are therefore not commensurate in scope with the results in the 132 declaration filed 2-5-08 and the results in the specification.

Second: The results for Experiment 1 in the 132 declaration filed 2-5-08 are for glass fibers treated with "sulfur containing mercaptosilane". In the 132 declaration filed 2-5-08, the specific composition of the "sulfur containing mercaptosilane" is not known. The results for Example 1in the specification are for glass fibers treated with "sulfur containing mercaptosilane". In the specification, the specific composition of the "sulfur containing mercaptosilane" is also not known. The 132 declaration filed 2-5-08 and the specification fail to present results for *different types* of "sulfur containing mercaptosilanes. It is not seen how the results in the 132 declaration filed 2-5-08 and the specification are commensurate in scope with the *genus* "sulfur containing mercaptosilane" (in constant to a *species* of "sulfur containing mercaptosilanes").

Third: Uchida's tire with radially oriented short glass fibers in the rubber tread has improved braking performance on ice and improved abrasion resistance (e.g. compared with comparative example 3). The secondary art strongly motivates one of

ordinary skill in the art to treat glass fibers with an anchoring agent to deal with the well known problem of bonding glass fibers to rubber. The results of braking properties and abrasion resistance naturally flow from Uchida's teaching to use thickness oriented glass fibers in tread rubber to improve braking properties and abrasion resistance and the secondary art's teaching to use an anchoring agent to improve the bond between glass fibers and rubber and thereby obtain fuller utilization of the desirable properties of the glass fiber component. See col. 1 lines 45-51, col. 2 lines 16-71 and col. 3 lines 1-20 of Marzocchi 059. In other words, the results of using treated glass fibers to improve braking resistance on ice and abrasion resistance are the expected and predicted results because (1) Uchida teaches using the glass fibers in combination with the specified ratio E1/E2 and tread rubber hardness to improve braking performance on ice and abrasion resistance and (2) Marzocchi 059 teaches that glass fibers are better able to contribute their properties to products fabricated thereof when the glass fibers are treated such that a strong and permanent bonding relationship is developed between the glass fiber surfaces and the elastomeric material.

Fourth: Applicant's Experiment 2 (improper fiber orientation, 132 declaration filed 2-5-08), Experiment 4 (improper fiber orientation, 132 declaration filed 2-5-08), Comparative Example 1 (no short fibers, specification), Comparative Example 3 (improper fiber orientation, specification), Comparative Example 4 (complex elastic modulus ratio outside of claimed range, specification) and Comparative Example 5 (tread hardness outside of claimed range, specification) fail to compare the invention with the closest prior art (Uchida) because Uchida's tire tread has short fibers, the

claimed fiber orientation, the claimed ratio E1 :E2 of 1.1 to 4 and the claimed hardness of 45-75 degrees.

When all of the evidence is considered, including the teachings of the applied prior art (e.g. Uchida's disclosure of braking performance of 125 for tire tread having thickness direction oriented glass fibers in rubber, Marzocchi 059's teaching to use a mercaptan-containing organo silane anchoring agent to obtain a strong and permanent bond between glass fibers and rubber) and the totality of the rebuttal evidence (e.g. examples in the specification and 132 declaration), it is examiner's opinion that, on balance and in light of the scope of the present claims, the rebuttal evidence fails to outweigh the evidence of obviousness.

8) Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven D. Maki whose telephone number is (571) 272-1221. The examiner can normally be reached on Mon. - Fri. 8:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on (571) 272-1226. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Steven D. Maki/
Primary Examiner, Art Unit 1791

Steven D. Maki
February 27, 2008